

REMARKS

In view of the following reasoning for allowance, the applicants hereby respectfully request further examination and reconsideration of the subject application.

A. Request for An Interview with Examiner Becker and Examiner Weilun Lo.

The applicants request an Interview with Examiner Becker and Examiner Weilun prior to another Office Action being issued with respect to this application.

B. Claim Rejections of Claims 1-38 under 35 USC 112, first paragraph

Claims 1-38 were rejected under 35 USC 112, first paragraph, as failing to comply with the enablement requirement. The Examiner alleged that the claims subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention. The applicants respectfully disagree with this contention.

Examiner Shashi Becker and the applicant's representative Katrina Lyon on 16 July 2007 held an interview to discuss the applicant's response to the Final Office Action of May 9, 2007. The Examiner during this meeting clarified her rejections previously presented saying that she relied on Dayton to teach an image stack where layers of an image are the images of the image stack. The applicant's representative stated that the claim language clearly identified an image stack as a stack of original images taken from the same point of view, which is different than the layers of an image. Since an agreement could not be reached the applicant's representative agreed to clarify the claim language to differentiate the image stack more distinctly from a layered image. As a result, the claims were amended to define the image stack as a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view. It is believed that this amendment clearly distinguishes the claims from the cited art.

Clearly there is support for this amendment to the claim language as the specification clearly calls out in section 2.2

"An image stack is a set of identically sized registered images that may originate from any stationary still or video camera. The images in the image stack typically vary in one or more of the time they were taken, the lighting direction and amount, focus, exposure and/or camera position. Additionally, sometimes the images in the image stack are of different subject matter and may contain different meta data (such as exposure)."

No one with ordinary skill in the art would presume that this description refers to a drawing with different drawing layers. Clearly, different images taken by a still or video camera are described, not layers of single image. The applicants merely amended the claim because the Examiner was claiming that a layered drawing is the same as a set of original images. The enablement requirement is clearly met in the Summary (pp. 2-6) and in FIG. 2, on page 15, lines 7-27 which distinctly call out separate original images, not layers of a single image.

The applicants respectfully request reconsideration of the rejection of Claims 1-38.

C. Claim Rejection Under 35 USC 101 of Claims 28-38.

Claims 28-38 were rejected under 35 USC 101, first paragraph, because it was claimed that the claimed invention was directed to non-statutory subject matter.

Claim 28 was rejected because it was contended that the claim limitation "computer-readable medium" is directed toward non-statutory subject matter because it could be a "modulated data signal". The applicants have amended the specification and Claim 28 to overcome the 101 rejection.

While the applicant does not admit to and does not believe that the aforementioned disclosed meaning is non-statutory subject matter, it has been decided to amend the specification to eliminate any reference to a computer readable medium including a modulated signal such as a carrier wave. The intent of the amendment to the specification is to limit the claimed invention to the use of *physical* computer readable media, and that the use of carrier waves is not intended to be included in the scope of the claimed invention.

In view of the amended specification, it is believed Claim 31 is patentable under 35 USC 101. Therefore, it is respectfully requested that the rejection of this claim be reconsidered.

Claims 29-38 were rejected because it was alleged that a graphical user interface not being clearly defined and therefore could be interpreted as being directed towards non-statutory subject matter "such as software". The applicants respectfully disagree with this rejection.

The concept of a graphical user interface *per se* is known to those with ordinary skill in the art. Per Wikipedia a graphical user interface is defined as, "A graphical user interface or GUI is a type of user interface which allows people to interact with a computer and computer-controlled devices. Instead of offering only text menus, or requiring typed commands: graphical icons, visual indicators or special graphical elements called "widgets", are presented. Often the icons are used in conjunction with text, labels or text navigation to fully represent the information and actions available to a user. The actions are usually performed through direct manipulation of the graphical elements." Additionally, the graphical user interface of the claimed invention is clearly depicted in FIGs 10, 11, 12 and 13 and the specification associated with these figures (pages 22-24). However, to further clarify Claim 29, the applicants have amended this claim to state that the graphical user interface is displayed on a display device.

D. The 35 USC 103 Rejection of Claims 1, 4, 7-13, 16, 18-23, 28, 29 and 30-37.

Claims 1, 4, 7-13, 16, 18-23, 28, 29 and 30-37 were rejected under 35 USC 103(a) as being unpatentable over Beeman, U.S. Publication No. US2003/0190090, in view of Hsu, U.S. Patent No. 6,078,701. The Examiner contended that Beeman teaches all the elements of the applicants claims but does not teach the applicant's image stack. The Examiner contended, however, that Hsu teaches this feature. The applicants respectfully disagree with this contention of obviousness.

In order to deem the applicants' claimed invention unpatentable under 35 USC 103, a *prima facie* showing of obviousness must be made. To make a *prima facie*

showing of obviousness, all of the claimed elements of an applicants' invention must be considered, especially when they are missing from the prior art. If a claimed element is not taught in the prior art and has advantages not appreciated by the prior art, then no *prima facie* case of obviousness exists. The Federal Circuit court has stated that it was error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein (*In Re Fine*, 837 F.2d 107, 5 USPQ2d 1596 (Fed. Cir. 1988)).

The applicants' claimed invention employs an "image stack" in easily combining individual images into an enhanced composite image. An *image stack* is a set of separate non-layered identically-sized registered images (e.g., the same pixel in each image represents more or less the same thing and inherently they are taken from the same point of view) that may originate from any stationary still or video camera, each image being taken at a distinct time. One way to envision an image stack is as a three dimensional (3D) collection of pixels defined by a set of images (or a short video). In the 3D pixel set, the normal X and Y dimensions define the coordinates of a single image. The Z (or time) dimension defines which image in the stack (or what point in time in a video). A *span* of pixels is the set of all pixels at some (X, Y) location in all images of the image stack. Filters may be applied to the 3D image stack, or a portion thereof, to create one or more new 2D intermediate images. A filter is a function that operates on the 3D image stack to create a 2D image. An *intermediate image* is one created by running a filter on the image stack, where the image stack is a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view. (see Summary)

In contrast, Beeman teaches a technique for enhancing related digital images through a user-friendly interactive-interview process. A digital-image-processing system may be implemented with a user interface, a data manager, and an image processor. The user interface identifies a flawed region of a first digital image and a substitute region. The image processor is configured to generate a composite image comprising the first digital image and the substitute region wherein the image processor is responsive to an interactive interview process. A digital-image

processing method includes receiving related digital-image information, identifying an undesirable feature within the digital-image information, associating a desired feature within the digital-image information with the undesirable feature, replacing the undesirable feature with the desirable feature, and adjusting the image information responsible for generating the desirable feature to produce a modified digital image. **Nowhere does Beeman teach an image stack “comprising a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured...”** **Nor does Beeman teach “applying one or more filters to the image stack to create one or more new intermediate images”.** There is no mention in Beeman of a filter that is a function that operates on the 3D image stack to create a 2D image.

Hsu teaches a method and apparatus that determines the topology of a sequence of images and then globally aligns the images with respect to each image's neighboring images. The apparatus includes a topology determination module, a local coarse registration module, a local fine registration module, a global consistency module, and a color matching/blending module. To accurately render a mosaic image from a sequence of images the topology determination and global alignment processes are iterated to progressively produce accurately aligned images. The apparatus efficiently and accurately combines a plurality of source images into a seamless panoramic mosaic representation of a scene, of arbitrarily wide spatial and angular extent, regardless of the order of image acquisition. However, Hsu technique performs image processing by stitching together images to create a single tiled image. **Hsu’s technique uses different points of camera view to create this mosaic in cases where a camera is used to travel in a straight line and capture images of a scene (column 18, lines 9-54, column 16, lines 44-67).** Therefore, Hsu also does not teach an image stack “comprising a stack of original images a stack of non-layered, separate original images, each

original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured..." Nor does Hsu teach "applying one or more filters to the image stack to create one or more new intermediate images". There is no mention in Hsu of a filter that is a function that operates on the 3D image stack to create a 2D image.

Granted, the Examiner states that Beeman teaches the applicant's claimed features (inputting an image stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view; applying one or more filters to the image to create one or more new intermediate images; selecting one of the original images in the image stack or an intermediate image as a source image) at paragraphs [0042-0047] and (selecting pixels from the source image to be added to a composite image to create a final composite image) at paragraphs [0068-0069]. These paragraphs state,

"[0042] Region "A" data 323 includes information that defines a region of interest from image "A" data 322. The region "A" data 323 defines an area of a baseline image that an operator of the IAES 10 deems flawed or undesirable in some way. As previously discussed, the flawed region may contain a contorted facial feature, a stain or other mark on clothing, and other similar items that may be deemed unacceptable by the operator.

[0043] Region "B" data 325 includes a region of interest from a related image such as image "B" data 324 that the operator defines via the user interface 310 as a potential substitute for the flawed region "A" data 323. It should be appreciated that under some conditions, such as a stain or undesirable symbol on an article of clothing, the region "B" data 325 may be selected from a separate sub-region of the image "A" data 322. Under most conditions however, the region "B" data 325 will be identified by an operator from the related image "B" data 324. The region "B" data 325 includes information that both defines the boundaries of a proposed-substitute region of interest from a related image or a portion of the baseline image as described above, but the underlying image data as well.

[0044] Once the operator of the IAES 10 has identified the related images (i.e., image "A" data 322 and image "B" data 324), the flawed region from a baseline image, and a proposed-substitute region from a related image (i.e., region "A" data 323 and region "B" data 325) the image enhancer 300 may be programmed to transfer the various image data to the image processor 330. Upon receipt of the replacement or substitute data, the image processor may be programmed to identify and align one or more reference points from the underlying image "A" data 322 and the region "B" data 325 so as to locate and size the substitute-image information within the image "A" data 322 to produce an interim modified image (not shown).

[0045] It will be appreciated that for a number of reasons, the image information contained

within the region "B" data 325 may not acceptably match the surrounding image information from the remaining image "A" data 322 after the initial substitution. For example, the lighting conditions under which the image "A" data 322 and the image "B" data 324 were acquired may have been different. As a result, it may be easy to identify that portion of the interim-modified image because of perceived color, brightness, contrast, and/or other image-parameter differences.

[0046] At this point, the image enhancer 300, via the user interface 310, will enter an interrogatory session programmed to illicit information from the operator that indicate one or more image-processing parameter changes that when applied by the image processor over the region "B" data 325 will result in a modified version of the region "B" data 327 that when inserted or overlayed on the image "A" data 322, will generate a modified image "A" (not shown) that will be acceptable to the operator. The image-enhancer logic may use various criteria to determine appropriate questions to present to the operator based on both previous responses, as well as image statistics derived from an analysis of the surrounding regions of the base image. In some embodiments, the image-enhancer logic uses the image statistics from the surrounding regions of the base image to preset image-processing parameters applied over the substitute region.

[0047] Furthermore, these embodiments present both the first-generation image containing the unmodified region "B" data 325 identified by the operator as well as the next-generation modified image in a format that facilitates comparison by an operator of the system. The data manager 320 and user interface 310 may work together to generate an enhanced-image instance 500 that displays image data in a number of different layouts and formats. These layouts and formats may be dictated by the underlying imaging modality used to acquire the digital images (photographs, video, medical diagnostics, etc.) or may be configured by the user. Typical displays may contain dual images, thumbnail displays, or a composite of multiple related images. In some embodiments, suited for more advanced users of image-editing software, the user interface 310 may provide image statistics for both the baseline and the substitute regions of the first-generation image, as well as the modified-substitute region in addition to the image data."

And,

"[0067] 1. Binary Operations

[0068] Operations based on binary (Boolean) arithmetic form the basis for a powerful set of tools that will be described here and under the section describing mathematical morphology. The operations described below are point operations and thus admit a variety of efficient implementations including simple look-up tables. The standard notation for the basic set of binary operations is as follows:

1 NOT c = {overscore (a)} OR c = a + b AND c = a .cndot. b XOR x = a .sym. b = a .cndot. {overscore (b)} + {overscore (a)} .cndot. b SUB c = a.backslash.b = a - b = a .cndot.{overscore (b)}

[0069] The implication is that each operation is applied on a pixel-by-pixel basis. For example, c[m,n]=a[m,n].multidot.{overscore (b)}[m,n] .A-inverted.m,n. The definition of each operation is:

2TABLE I Binary Operations. NOT a 0 1 1 0 OR b a 0 1 0 0 1 1 1 1 AND b a 0 1 0 0 0 1 0 1 XOR b a 0 1 0 0 1 1 1 0 SUB b a 0 1 0 0 0 1 1 0"

These passages merely appear to teach cutting and pasting one portion of an image to another and binary pixel operations. Clearly, these passages from Beeman do not teach inputting an image stack "comprising a stack of

non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured..." Nor do these passages teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.

Further, the Examiner states that Hsu teaches the image stack made of images where the pixel position of each original image in the image stack is defined in a three dimensional coordinate system at column 18, lines 30-46 and at column line 44-column 17 line 9. However, if one looks at these paragraphs, as well as the paragraphs immediately before and after these paragraphs it is clear that Hsu teaches an image stack created of images taken from multiple points of view.

For example, column 16 lines 44-46 state,

"The invention as described above creates mosaics of scenes from two-dimensional imagery. Computation of the three-dimensional structure and its representation has not been explicitly dealt with in the foregoing discussion. The following describes an illustrative process for extending the invention to include generation of three-dimensional mosaics representing a three-dimensional scene. Prior techniques for processing and utilizing three-dimensional representations of scenes are disclosed in U.S. patent application Ser. No. 08/499,934 filed Jul. 10, 1995, which discloses view-based three-dimensional representations from a local collection of viewpoints. The present invention can be used to extend these techniques to create three-dimensional spherical mosaic representations of extended scenes.

In order to represent the three-dimensional information of a scene from a given viewpoint, a two-dimensional spherical mosaic is created from the given viewpoint and then from a few more viewpoints (typically one more but may be more) by changing the location of the camera. This process creates extended views of the scene, one each from the chosen camera positions. One main advantage of creating a spherical mosaic representation from every viewpoint is that each such viewpoint provides a much wider field of view than just a single image from that viewpoint." (emphasis added)

Likewise, column 18 lines 9-29 state,

"When the camera is moved through an environment, in general it changes orientation (rotates) and changes location (translates). In this situation, a mosaic of the scene cannot be created by a coordinate system located at/around one center of projection. The present invention can be used to solve this problem for some specific situations.

The key idea that is exploited here for creating mosaics with arbitrary motions of the

camera is that no explicit depth reconstruction is required. The mosaics are created by assembling together closely spaced registered strips of images.

In order to describe the basic ideas of this implementation of the invention, the invention shall first be described in the context of the simplest case for three-dimensional mosaics: a camera moving in a straight line and looking at right angles to the direction of motion. The image planes are all coplanar for this case. Assuming continuous images and continuous motion, the central vertical line of each image is seen only in that image and hence by stacking together these central lines, a three-dimensional mosaic of arbitrary extent may be created.

Another way to create such a mosaic is to stack each of the images in an xyt cube where xy is the spatial image coordinate system and t is the time dimension. In the continuous case (or the dense sampling case), a slice through this cube along the y=y.sub.c (where y.sub.c is the y co-ordinate of the center of the image) plane creates the required mosaic.

In the more realistic situation of finite sampling of the frames in time, it has been shown in the art that any arbitrary view of the scene between any two views may be created by linear interpolation of the flow vectors between two consecutive images. This implies that even when the captured frames are coarsely sampled in time, an arbitrarily dense time sampling may be created by view interpolation. Once such a sampling is available, the creation of the mosaic is trivial as discussed above. Note that the densely sampled complete image frames need not be created but only the central slit of each frame.”
(emphasis added)

Nor does Hsu teach “applying one or more filters to the image stack to create one or more new intermediate images”. There is no mention in Hsu of a filter that is a function that operates on the 3D image stack to create a 2D image.

Neither Beeman nor Hsu teach the applicants' claimed image stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, which may be used for a variety of applications such as, for example, creating high dynamic range images, combining images captured under different lighting conditions, removing objects from images, and combining images captured at multiple points in time or with different focal lengths. Nor do Beeman or Hsu teach the applicants' claimed “applying one or more filters to the image stack to create one or more new intermediate images”. Additionally, the Beeman and Hsu references do not teach the advantageous features of the applicants' claimed invention such as being able to create a variety of special effects using the image stack with filters. Accordingly, no *prima facie* case of obviousness has been established in accordance with the

holding of *In Re Fine*. This lack of *prima facie* showing of obviousness means that the rejected claims are patentable under 35 USC 103 over Beeman in view of Hsu. As such, it is respectfully requested that Claims 1, 4, 7-13, 16, 18-23, 28, 29 and 30-37 be allowed based on the following exemplary claim language:

"A computer-implemented process for creating a composite image, comprising using a computer to perform the following process actions:

inputting an image stack comprising a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured;

applying one or more filters to the image stack to create one or more new intermediate images;

selecting one of the original images in the image stack or an intermediate image as a source image; and

selecting pixels from the source image to be added to a composite image to create a final composite image."

And,

"A system for compositing digital images, the system comprising:

a general purpose computing device; and

a computer program comprising program modules executable by the computing device, wherein the computing device is directed by the program modules of the computer program to,

input an image stack comprising a stack of original non-layered, separate images, each original image captured at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in an x, y, z coordinate system, where x and y define the width and height of each image in the image stack and z defines an image taken in time;

apply at least one filter to the image stack to create at least one intermediate image;

select at least one original image or at least one intermediate image to serve as a source image; and

select portions from the source image to be added to a composite image to create a final composite image."

And,

"A computer-readable medium having computer-executable instructions stored thereon for editing an image, said computer executable instructions operable to:

input an image stack comprising a stack of separate, non-layered images taken at distinct times from the same point of view, wherein the pixel position of each in the image stack is defined in a three dimensional coordinate system, wherein one dimension is time;
apply a filter to the image stack to create intermediate images;
select one of the images in the image stack or an intermediate image to serve as a source image for creating a new composite image; and
select pixels from the source image to create a final composite image."

E. The 35 USC 103 Rejection of Claims 7, 9, 12, 13, 18, 20, 22, 23 and 33-37.

Claims 7, 9, 12, 13, 18, 20, 22, 23 and 33-37 were rejected under 35 USC 103(a) as being unpatentable over Beeman and Hsu (as discussed above) in further view of Dayton (Photoshop 3), herein after Dayton. The Examiner contended that though Beeman and Hsu do not teach various features of these claims, Dayton teaches these features. The applicants respectfully disagree with this contention of obviousness.

The applicants' claimed invention employs an "image stack comprising a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured in easily combining individual images into an enhanced composite image. One way to envision an image stack is as a three dimensional (3D) collection of pixels defined by a set of images (or a short video). In the 3D pixel set, the normal X and Y dimensions define the coordinates of a single image. The Z (or time) dimension defines which image in the stack (or what point in time in a video). Inherantly the images are taken from the same point of view because the pixels in each image more or less represent the same thing (see Summary).

As discussed above, neither Beeman nor Hsu teach an image stack wherein images are taken from the same point of view. **Nor do Beeman and Hsu teach "applying one or more filters to the image stack to create one or more new**

intermediate images” where a filter is a function that operates on the 3D image stack to create a 2D image.

Dayton teaches a technique for applying filters to a single image. But Dayton does not teach a filter as defined in the applicants' specification that **is a function that operates on the 3D image stack to create a 2D image**. Nowhere does Dayton teach an image stack “comprising a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured...” Dayton also does not teach this feature. **Nor does Dayton teach “applying one or more filters to the image stack to create one or more new intermediate images” where a filter is a function that operates on the 3D image stack to create a 2D image.**

In fact Dayton actually destroys the function of Beeman because it would not be possible to edit a picture as taught in Beeman with a layered image or drawing since it would be unclear which portion of the image the user wants to replace in an image with several images. It is well settled in the law that a 35 USC 103 rejection based on a modification of prior art that destroys the function of the invention disclosed in the prior art, is improper and does not establish a *prima facie* case of obviousness. *In Re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). There is simply no technological motivation for a worker to make such a detrimental modification. To the contrary, a significant disincentive exists. In this case, the proposed substitution of applying a filter to an image in Dayton would make one image of the image set unlike the other so it would look mismatched to composite the two images to remove an undesired feature. This would destroy the functionality of the Beeman invention and so a *prima facie* case of obviousness cannot be established from the cited references.

Additionally, the Beeman, Hsu and Dayton references do not teach the advantageous features of the applicants' claimed invention such as being able to create a variety of special effects using the image stack. Accordingly, no *prima facie* case of obviousness has been established in accordance with the holding of *In Re*

Fine. This lack of *prima facie* showing of obviousness means that the rejected claims are patentable under 35 USC 103 over Beeman in view of Hsu and Dayton. As such, it is respectfully requested that Claims 1, 4, 7-13, 16, 18-23, 28, 29 and 30-37 be allowed based on the following claim language.

"A computer-implemented process for creating a composite image, comprising using a computer to perform the following process actions:

inputting an image stack comprising a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured;

applying one or more filters to the image stack to create one or more new intermediate images;

selecting one of the original images in the image stack or an intermediate image as a source image; and

selecting pixels from the source image to be added to a composite image to create a final composite image."

And,

"A system for compositing digital images, the system comprising:

a general purpose computing device; and

a computer program comprising program modules executable by the computing device, wherein the computing device is directed by the program modules of the computer program to,

input an image stack comprising a stack of original non-layered, separate images, each original image captured at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in an x, y, z coordinate system, where x and y define the width and height of each image in the image stack and z defines an image taken in time;

apply at least one filter to the image stack to create at least one intermediate image;

select at least one original image or at least one intermediate image to serve as a source image; and

select portions from the source image to be added to a composite image to create a final composite image."

And,

"A computer-readable medium having computer-executable instructions stored thereon for editing an image, said computer executable instructions operable to:

input an image stack comprising a stack of separate, non-layered images taken at distinct times from the same point of view, wherein the pixel position of each in the image stack is defined in a three dimensional coordinate system, wherein one dimension is time;
apply a filter to the image stack to create intermediate images;
select one of the images in the image stack or an intermediate image to serve as a source image for creating a new composite image; and
select pixels from the source image to create a final composite image.”

“A computer-readable medium having computer-executable instructions stored thereon for editing an image, said computer executable instructions operable to:

input an image stack comprising a stack of separate, non-layered images taken at distinct times from the same point of view, wherein the pixel position of each in the image stack is defined in a three dimensional coordinate system, wherein one dimension is time;
apply a filter to the image stack to create intermediate images;
select one of the images in the image stack or an intermediate image to serve as a source image for creating a new composite image; and
select pixels from the source image to create a final composite image.

And,

“A graphical user interface displayed on a display device for creating a composite image, comprising:

a source image window for displaying a source image derived from an image stack comprised of a stack of separate, non-layered original images, each separate non-layered image being taken at a distinct time and from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions of the three dimensional coordinate system describe the dimensions of each image in the image stack, and the third dimension describes a time a different image was captured; and

a composite image window wherein a composite image is displayed that is composed of parts of said source image that are transferred from the source image to the composite image by a user.”

F. The 35 USC 103 Rejection of Claims 3 and 17.

Claims 3 and 17 were rejected under 35 USC 103(a) as being unpatentable over Beeman and Hsu (as discussed above) in further view of Joidon (U.S. Patent No. 5,493,419), herein after Joidon. The Examiner contended that though Beeman and Hsu do not teach applying a slice filter, Joidon teaches this feature. The applicants respectfully disagree with this contention of obviousness.

Neither Beeman nor Hsu teach the applicants' claimed image stack, comprising a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured wherein images are taken from the same point of view, which may be used for a variety of applications such as, for example, creating high dynamic range images, combining images captured under different lighting conditions, removing objects from images, and combining images captured at multiple points in time or with different focal lengths. Nor do these references teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.

Jodoin teaches an apparatus for the enhancement of 1 bit per pixel image signals to produce a multiple-bit per pixel form. **A single binary input image is passed through a plurality of filters to generate level slices. However, Jodoin also does not teach the applicants' claimed image stack wherein non-layered separate images are taken from the same point of view at distinctly different times. Nor does Joidon teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.**

Additionally, the Dayton, Hsu and Joidon references do not teach the advantageous features of the applicants' claimed invention such as being able to create a variety of special effects using the image stack. Accordingly, no prima facie case of obviousness has been established in accordance with the holding of *In Re Fine*. This lack of prima facie showing of obviousness means that the rejected claims are patentable under 35 USC 103 over Dayton in view of Hsu and Joidon. As such, it is respectfully requested that Claims 3 and 17 be allowed based on the aforementioned claim language.

G. The 35 USC 103 Rejection of Claims 14, 26 and 27.

Claims 14, 26 and 27 were rejected under 35 USC 103(a) as being unpatentable over Beeman and Hsu (as discussed above) in further view of Okamoto et al (U.S. Patent No. 5754618), herein after Okamoto. The Examiner contended that though Beeman and Hsu do not teach applying a surface filter that operates on a given surface through the image stack and a surface within the image stack that is user defined, Okamoto teaches this feature. The applicants respectfully disagree with this contention of obviousness.

As mentioned previously, neither Beeman nor Hsu teach the applicants' claimed image stack, wherein images are taken from the same point of view, and which may be used for a variety of applications such as, for example, creating high dynamic range images, combining images captured under different lighting conditions, removing objects from images, and combining images captured at multiple points in time or with different focal lengths. **Nor do they teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.**

Okamoto also does not teach the applicant's claimed image stack of original non-layered images taken at different times wherein the third dimension represents time and wherein images are taken from the same point of view. **Nor does Okamoto teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.**

Additionally, the Dayton, Hsu and Okamoto references do not teach the advantageous features of the applicants' claimed invention such as being able to create a variety of special effects using the image stack wherein images are taken from the same point of view. Accordingly, no prima facie case of obviousness has

been established in accordance with the holding of *In Re Fine*. This lack of prima facie showing of obviousness means that the rejected claims are patentable under 35 USC 103 over Dayton in view of Hsu and Okamoto. As such, it is respectfully requested that Claims 14, 26 and 27 be allowed based on the aforementioned claim language.

H. The 35 USC 103 Rejection of Claims 15, 24 and 25.

Claims 15, 24 and 25 were rejected under 35 USC 103(a) as being unpatentable over Beeman and Hsu (as discussed above) in further view of Chuang et al., "Video Matting of Complex Scenes", herein after Chuang. The Examiner contended that though Dayton and Hsu do not teach applying a mat filter that produces a mat of a given portion of the image stack, Chuang teaches this feature. The applicants respectfully disagree with this contention of obviousness.

As discussed previously neither Beeman nor Hsu teach the applicants' claimed image stack wherein the images are a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured. **Nor do Beeman and Hsu teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.**

Chuang also does not teach the applicant's claimed image stack wherein non-layered images are taken from the same point of view at distinct times. **Nor does Chuang teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.**

Additionally, the Beeman, Hsu and Chuang references do not teach the advantageous features of the applicants' claimed invention such as being able to create a variety of special effects using the image stack. Accordingly, no prima facie case of obviousness has been established in accordance with the holding of *In Re Fine*. This lack of prima facie showing of obviousness means that the rejected claims are patentable under 35 USC 103 over Beeman in view of Hsu and Chuang. As such, it is respectfully requested that Claims 15, 24 and 25 be allowed based on the aforementioned claim language.

I. The 35 USC 103 Rejection of Claim 38.

Claim 38 was rejected under 35 USC 103(a) as being unpatentable over Beeman and Hsu (as discussed above) in further view of Funayama et al. (U.S. Patent No. 6,389,155), herein after Funayama. The Examiner contended that though Dayton and Hsu do not teach a paint brush function that transfers all pixels associated with a face from a source image to a composite image when said paint brush function is used to select a portion of a face, Funayama teaches these features. The applicants respectfully disagree with this contention of obviousness.

Neither Beeman nor Hsu teach the applicants' claimed image stack comprising a stack of non-layered, separate original images, each original image taken at a distinct separate time from the same point of view, wherein the pixel position of each original image in the image stack is defined in a three dimensional coordinate system, and wherein two dimensions describe the dimensions of each image in the image stack, and the third dimension describes the time an image was captured and which may be used for a variety of applications such as, for example, creating high dynamic range images, combining images captured under different lighting conditions, removing objects from images, and combining images captured at multiple points in time or with different focal lengths. Nor do they teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.

Funyama also does not teach the applicant's claimed image stack of non-layered images taken at distinct times and from the same point of view. Nor does Funyama teach "applying one or more filters to the image stack to create one or more new intermediate images" where a filter is a function that operates on the 3D image stack to create a 2D image.

Additionally, the Beeman, Hsu and Funayama references do not teach the advantageous features of the applicants' claimed invention such as being able to create a variety of special effects using the image stack. Accordingly, no prima facie case of obviousness has been established in accordance with the holding of *In Re Fine*. This lack of prima facie showing of obviousness means that the rejected claims are patentable under 35 USC 103 over Beeman in view of Hsu and Funayama. As such, it is respectfully requested that Claim 38 be allowed based on the aforementioned claim language.

In summary, it is believed that the claims 1-38 are in condition for allowance. Allowance of these claims at an early date is courteously solicited.

Respectfully submitted,


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